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sounds has been most satisfactory they have been made up of the fundamental and *string* over-tones and not by the combination of the pitch tone with a 'characteristic pitch' having no harmonic relations between the two. In the case of spoken vowels it seems to me of fundamental importance that the individual should speak upon a known pitch, otherwise the case is hopelessly confused by a constantly changing fundamental. In a great many of the investigations involving the so-called characteristic pitch of the different vocal sounds, it seems uncertain as to whether or not this so-called 'characteristic pitch' may not be more directly due to some inherent rate in the apparatus itself, rather than in the sound which it is supposed to record impartially. In this connection it must be borne in mind that the widest possible variations in tone quality are still recognized as the same vowel spoken by different individuals under different conditions. This discussion has wandered from the musical instrument to the articulator. In music the vowel is everything, the consonant usually inconspicuous; in speech the vowel is secondary and the consonants all-important.

WILLIAM HALLOCK.

PHYSICAL LABORATORY,
COLUMBIA UNIVERSITY, June, 1901.

'IS LARVÆ CONTAGIOUS?'

THE following cross interrogatories were prepared by the district attorney of a county in a western State for a deposition.

What is larvæ? What does larvæ come from? Is larvæ injurious to fruit trees? Is it contagious?

What is pupæ? [Describe it fully? Is it injurious to fruit trees? Is it contagious?

It seems to me that the questions furnish an answer to the frequent question in the scientific laboratory, 'Will this ever be of any use to me?' If such knowledge furnish nothing else to a man, it would prevent him from making such questions as these.

H. S. GAUS.

CURRENT NOTES ON PHYSIOGRAPHY.

GLACIAL CORRIES IN THE BIGHORN MOUNTAINS.

THE glaciated district near Cloud Peak, Bighorn Mountains, at altitudes above 10,000 feet,

contains over forty corries or cirques of more or less pronounced form, as mapped and described by Matthes ('Glacial Sculpture of the Bighorn Mountains, Wyoming,' 21st Ann. Rep. U. S. Geol. Surv., 1900, pt. II., 167-190). A contour map shows the summit of the range in general with rounded forms free from sharp peaks and precipitous cliffs. The valleys on the slopes below 10,000 are usually broadly open; but on ascending towards the stream sources, the valley walls steepen on either side of a broad floor where rock basins hold many little lakes, and at or near the valley head the walls close in a great cliffed amphitheater. Highland streams cascade down from shallow hanging valleys into the deep cirques. It is concluded that these peculiar forms are here, as elsewhere, to be regarded as glacial modifications of preexistent valleys that once had more ordinary form. In a few cases, the widening and headward recession of the valley walls have resulted in the consumption of the rounded uplands of the mountains so far that only a narrow, sharp, serrate wall remains; this is well seen around Cloud Peak, thus giving support to Richter's views regarding the importance of glacial action in producing sharp peaks and arrêtes in the Alps. In a single remarkable example, an east-sloping valley (No. 20) receives the drainage of the uppermost mile of a southwest-sloping valley (No. 18) in such a way as to suggest very strongly the glacial capture of the latter by the former; and this is made the more probable when it is noted that the capturing valley has a distinctly stronger slope than the captured. If it be admitted that glacial erosion has made significant changes in the valley forms—and this does not seem to be open to dispute—the present pattern of drainage in these two valleys could not have existed in preglacial time.

It is a curious commentary on the education of our topographers that articles of the kind here referred to should be so rare.

THE NORTH GERMAN LOWLAND.

THE accounts of the North German lowland as a region of glacial topography by Berendt, Wahnschaffe, Keilhack and others are supplemented to an extraordinary degree of detail by

the folio sheets of the geological map (1:25,000) of Prussia and the Thuringian states, with explanatory texts. Several sheets of the area north of Berlin may be cited. In the neighborhood of Oderberg (46th Lieferung), the Oder turns sharply from the ancient westward waterway along the glacial margin past the site of Hamburg to the North Sea, into its present northward course past the site of Stettin to the Baltic. Hereabouts are several looped moraines with uneven hills and hollows, holding many pools and ponds; the loops are nicely marked by boulder belts, which have long furnished material for road-making. Outside of the morainic loops (southwest), stretch outwashed sand plains, the barren 'upper sands,' with deep-lying ground water. Inside of the moraines come the rolling uplands of the ground moraine, with a fertile soil. Overlaid sands and silts are common here, the deposits of ice-margin lakes held in the loops during glacial retreat; the outlets of the lakes are frequently found in trenches through the morainic hills. Some of the larger existing lakes of the district remain in shallow basins, roughly central to the morainic loops.

South of the outwashed sand plains, the broad channel of the ancient waterway (the Thorn-Eberwalder channel, the northern of the three chief ice-margin waterways) is strewn with the 'valley sands.' Once as smooth as the bed of a large river may be, these sands are now trenched and terraced to moderate depths west of Oderberg, where they are traversed only by small streams; but they are largely swept away southeast of Oderberg, where the ice-margin river sank to a lower level when the northern outlet past Stettin was opened. A new, broad channel was eroded at the lower level, with great sweeping curves appropriate to the course of a large river; the channel bed now remains as a marshy alluvial plain on which the diminished Oder wanders. One of the great curves of the channel rounds a spur of drift uplands by Oderberg; the 'new Oder' is led through the narrow neck of the spur by an artificial canal, while the 'old Oder' still straggles around the spur.

Where the ancient waterway departed somewhat from the moraines, a low upland slopes

southward to it from the morainic loops and their sand plains. The upland here is a gently rolling drift plain, traversed now and again by the sandy beds of larger or smaller streams that for a time came out from the ice on the north. A striking example of this kind is found near Kyritz (Lieferung, northwest of Berlin). The sandy stream bed was probably washed by sprawling currents in many braided channels, which acted partly as an aggrading agent, for the bed is hardly incised beneath the rolling drift plain. Later a narrow trench was cut through it, as if the ice-water had for a brief interval been changed from a turbid sand-bearing stream to a clear stream (perhaps the outflow of an ice-margin lake); the trench is now floored with peat, or occupied by long shallow lakes, as if it were barred here and there with inwashed alluvium.

The casual traveller often describes the north German lowlands as a 'flat and uninteresting country.' It is as meaningless to him as a cuneiform inscription would be; yet how significant its delicate details become when interpreted! To American students, the elaborate treatment of this remarkable field foreshadows what may in time be provided for us concerning the Illinois and other glacial lobes, whose general features only have now been sketched.

W. M. DAVIS.

MUSEUM REPORTS.

THE 'Annual Report of the Director' of the Carnegie Museum for the year ending March 31, 1901, was issued a short time ago, as well as the report on the 'Prize Essay Contest.' From the report we learn of the rapid progress of the institution particularly in the field of vertebrate paleontology, the explorations conducted last year by Mr. J. B. Hatcher having resulted in the acquisition of nearly 200 boxes of specimens, some of the more notable of which were described a short time ago in SCIENCE. As Mr. Hatcher again began field work in April, the present year will doubtless see other important accessions of fossils.

In zoology the announcement is made that the Museum has acquired a specimen of the almost extinct *Rhinoceros simus*, only four other ex-